



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,655	06/13/2006	Kenjiro Hamanaka	NSG-258US	6283
23122	7590	12/24/2009		
RATNERPRESTIA			EXAMINER	
P.O. BOX 980			MIYOSHI, JESSE Y	
VALLEY FORGE, PA 19482				
			ART UNIT	PAPER NUMBER
			2811	
			MAIL DATE	DELIVERY MODE
			12/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/562,655

Applicant(s)

HAMANAKA ET AL.

Examiner

JESSE Y. MIYOSHI

Art Unit

2811

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 4, 10, 17-20, 27-30, 36 and 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-9, 11-16, 21-26 and 31-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/5/2007, 4/18/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 4, 10, 17-20, 27-30, 36, 37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 13 October 2009.
2. Applicant's election without traverse of the species of figure 4a, 4b, 13a-g with corresponding claims 1-3, 5-9, 11-15, 16, 21-26, 31-35 in the reply filed on 13 October 2009 is acknowledged.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 2, 22 and 35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
5. Re claims 2 and 35, there is no support for the claimed "composite lens consisting of adjacently arranged plural parts of spherical lens, each center of the

spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area” “or a composite lens consisting of adjacently arranged plural parts of spherical lens and plural parts of cylindrical lens” as claimed in claims 2 and 35 within the figures of elected species of figure 4A and 4B and their corresponding portions of the specification.

6. Re claim 22, there is no support for the claimed “wherein each opening of the opening array consists of three micro circular openings which are located at the vertexes of a triangle” as claimed in claim 22 within the figures of elected species of figure 4A, 4B and 13A-G and their corresponding portions of the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Chiu et al. (U.S. PGPub 2001/0010449; hereinafter “Chiu”).

Re claim 1: Chiu teaches (e.g. figure 3) a lens-attached light-emitting element comprising: a light-emitting element (structure of figure 3) having a light-emitting area (322) on a semiconductor substrate (300); an antireflection film (326) covering the light-emitting area (322); and a lens (320) formed on the surface of the antireflection film (326) on the light-emitting element.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (U.S. 6,888,171; hereinafter "Liu") in view of Chiu.

Re claim 1: Liu teaches (e.g. figures 1 and 2) a lens-attached light-emitting element comprising: a light-emitting element (device of figure 1; hereinafter "**LED**") having a light-emitting area (**101**) on a semiconductor substrate (**203**).

Liu is silent as to an antireflection film covering the light-emitting area; and a lens formed on the surface of the antireflection film on the light-emitting element.

Chiu teaches an antireflection film (**326**) covering the light-emitting area (**322**); and a lens (**320**) formed on the surface of the antireflection film (**326**) on the light-emitting element (device of figure 3 of Chiu).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Chiu in the device of Liu in order to increase the output efficiency (see paragraph 10 of Chiu).

11. Claims 2, 3, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu modified by Chiu as applied to claim 1 above, and further in view of Bohn (U.S. 6,188,527) and Mesquida (U.S. 4,703,219).

Re claim 2: Liu modified by Chiu teaches the lens-attached light-emitting element.

Liu modified by Chiu is silent as to the lens is a composite lens consisting of adjacently arranged plural parts of spherical lens, each center of the spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area, or on the positions neighbored to the line, a composite lens consisting of adjacently arranged plural parts of cylindrical lens, each cylindrical lens having an axis along the line, or a composite lens consisting of adjacently arranged plural parts of spherical lens and plural parts of cylindrical lens.

Bohn teaches the lens is a composite lens consisting of adjacently arranged plural parts of spherical lens, each center of the spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area, or on the positions neighbored to the line, a composite lens (the lens **11** of Bohn along each straight portion of the light emitting surface of Liu) consisting of adjacently arranged plural parts of cylindrical lens, each cylindrical lens (**11**) having an axis along the line, or a composite lens consisting of adjacently arranged plural parts of spherical lens and plural parts of cylindrical lens.

It would have been obvious to use the teachings of Bohn in the device of Liu modified by Chiu in order to better uniformly distribute light upon a target (see column 2,

line 25 of Bohn) and to obtain the maximum efficiency of the device (see column 7, lines 32-35 of Mesquida).

Re claim 3: Liu modified by Chiu and Bohn teaches the lens-attached light-emitting element, wherein the line is an approximately U-shaped polygonal line (figure 1 of Liu shows U shape) consisting of three segments, and the composite lens is composed of four parts of spherical lens (**41** of Bohn), each center of the spherical lenses being on the both ends of each segment or the neighborhood of the both ends, and three parts of cylindrical lens (**11, 42**) each having an axis parallel with the segment, the four parts of spherical lens and three parts of cylindrical lens being adjacently arranged.

It would have been obvious to arrange spherical lens at corners of a light emitting region and a cylindrical lens along a length of light emitting region in order to maintain the optimum radial distance from the light emitting region to the lens (e.g. column 3, lines 43-47 of Mesquida) to maximize efficiency of the light emitting regions of the device (e.g. column 7, lines 32-35 of Mesquida).

Re claim 5: Liu modified by Chiu teaches the lens-attached light-emitting element, wherein the composite lens is made of resin (resin **320**; e.g. paragraph 33 of Chiu).

Re claim 6: Liu modified by Chiu, Bohn and Mesquida teaches the lens-attached light-emitting element, wherein the antireflection film (**326** of Chiu) is one-layer film, and the refractive index thereof has an intermediate value between that of the light-emitting area and that of the resin (**320** of Chiu) forming the composite lens.

Re claim 7: Liu modified by Chiu, Bohn and Mesquida teaches the lens-attached light-emitting element, wherein the antireflection film (**326** of Chiu) consists of silicon nitride (it is known for silicon nitride to be used as an antireflection layer, as evidenced by U.S. 4,644,342 to Abbas, see column 4, line 37).

12. Claims 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Bohn.

Re claim 8: Liu teaches (e.g. figures 1 and 2) a lens-attached light emitting element comprising: a light-emitting element (U shaped LED device of figure 1) having a light-emitting area (**101**).

Liu is silent as to a composite lens provided on the light-emitting element; wherein the composite lens consists of adjacently arranged plural parts of spherical lens, each center of the spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area, or on the positions neighbored to the line, a composite lens consisting of adjacently arranged plural parts of cylindrical lens, each cylindrical lens having an axis along the line, or a composite lens consisting of adjacently arranged plural parts of a spherical lens and plural parts of cylindrical lens.

Bohn teaches a composite lens provided on the light-emitting element; wherein the composite lens consists of adjacently arranged plural parts of spherical lens, each center of the spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area, or on the positions

neighbored to the line, a composite lens (the lens 11 of Bohn along each straight portion of the light emitting surface of Liu) consisting of adjacently arranged plural parts of cylindrical lens (11), each cylindrical lens having an axis along the line, or a composite lens consisting of adjacently arranged plural parts of a spherical lens and plural parts of cylindrical lens.

It would have been obvious to use the teachings of Bohn in the device of Liu in order to better uniformly distribute light upon a target (see column 2, line 25 of Bohn) and to obtain the maximum efficiency of the device (see column 7, lines 32-35 of Mesquida).

Re claim 9: Liu modified by Bohn teaches the lens-attached light-emitting element, wherein the line is an approximately U-shaped polygonal line consisting of three segments (U shaped LED device of figure 1 of Liu), and the composite lens is composed of four parts of spherical lens (41 of Bohn), each center of the spherical lenses being on the both ends of each segment or the neighborhood of the both ends, and three parts of cylindrical lens (11, 42) each having an axis parallel with the segment, the four parts of spherical lens and three parts of cylindrical lens being adjacently arranged.

It would have been obvious to arrange spherical lens at corners of a light emitting region and a cylindrical lens along a length of light emitting region in order to maintain the optimum radial distance from the light emitting region to the lens (e.g. column 3, lines 43-47 of Mesquida) to maximize efficiency of the light emitting regions of the device (e.g. column 7, lines 32-35 of Mesquida).

Re claim 11: Liu modified by Bohn teaches the lens-attached light-emitting element, wherein the composite lens is made of resin (epoxy; e.g. column 3, line 66 of Bohn).

13. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu as applied to claim 1 above, and further in view of Bohn.

Re claim 12: Chiu teaches the lens-attached light- emitting element (structure of figure 3) being recited in claim 1 or 8.

Chiu teaches substantially the entire claimed structure of claim 12, as recited in claim 1, except explicitly stating a lens-attached light-emitting element array, comprising a plurality of lens-attached light-emitting elements arranged in a straight line, wherein the lens-attached light- emitting element being recited in claim 1 or 8.

Bohn teaches (e.g. figure 1) a lens-attached light-emitting element array (structure of figure 1), comprising a plurality of lens-attached light-emitting elements (**13**, **14**) arranged in a straight line.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Bohn in the device of Chiu in order to obtain a device that is brighter and can more uniformly distribute light to a target area (see column 2, line 25 of Bohn).

Re claim 13: Chiu modified by Bohn teaches the lens-attached light-emitting element array (figure 1 of Bohn) according to claim 12, wherein the light-emitting element is a light-emitting diode (**300** of Chiu and **13** of Bohn).

14. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu modified by Bohn as applied to claim 12 above, and further in view of Tanioka et al. (U.S. 6,002,420; hereinafter "Tanioka").

Re claim 14: Chiu modified by Bohn teaches the lens-attached light-emitting element array according to claim 12.

Chiu modified by Bohn is silent as to the light-emitting element is a light-emitting thyristor.

Tanioka teaches where the light-emitting element (array of self-scanning LED chips; **30-1**) is a light-emitting thyristor (light emitting device is a light emitting thyristor; see claim 10 of Tanioka).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Tanioka in the device of Chiu modified by Bohn in order to enable the device to have an additional function of scanning and image recording.

Re claim 15: Chiu modified by Bohn and Tanioka teaches a self-scanning light-emitting element array (array of self-scanning LED chips; **30-1**), comprising a lens-attached light-emitting element array recited in claim 14.

15. Claims 16, 22, 24, 26, 31, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (U.S. 5,711,890; hereinafter "Hawkins") in view of Bohn.

Re claim 16: Hawkins teaches (e.g. figures 4A-E) a method for manufacturing a lens-attached light-emitting element, comprising the steps of: (a) preparing a light-emitting element array substrate ; (b) preparing a glass substrate (**100**); (c) forming a etching stopper film (**110**) on the glass substrate (**100**); (d) forming an opening array (**114**) in the etching stopper film (**110**); (e) forming a recess array (**120a**) in the glass substrate (**100**) under the opening array (**114**) by wet etching (wet etch, e.g. column 5, line 54); (f) fabricating a mold by removing the etching stopper film (**110**) on the recess array (**120a**); (g) coating a resin (**130**) on the surface of at least one of the recess array (**120a**) of the mold and the light-emitting element array substrate;

Hawkins is silent as to the resin being a photo-curing resin (h) contacting the mold and the light emitting element array substrate to each other with sandwiching the photo-curing resin therebetween and pressing to each other develop the photo-curing resin therebetween; (i) irradiating light to the photo-curing resin from the side of the mold to cure the photo-curing resin at the portion where the etching stopper film is previously removed; (j) separating the mold from the light-emitting element array substrate; and (k) removing the uncured photo-curing resin on the light emitting element array substrate by cleaning.

Bohn teaches the resin being a photo-curing resin (lens cured by UV, epoxy; e.g. column 3, line 29 and 66) (h) contacting the mold and the light emitting element array substrate to each other with sandwiching the photo-curing resin (epoxy) therebetween and pressing to each other develop the photo-curing resin therebetween (lens mold pressed onto material of lens; e.g. column 4, line 26); (i) irradiating light to the photo-

curing resin from the side of the mold to cure the photo-curing resin at the portion where the etching stopper film is previously removed (lens must be cured; e.g. column 3, line 38); (j) separating the mold from the light-emitting element array substrate (molds are typically not included into the final product); and (k) removing the uncured photo-curing resin on the light emitting element array substrate by cleaning (it is known in semiconductor processing for cleaning processes to be typically used to remove unwanted material).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Bohn in the method of Hawkins in order to result in a method that produces a lens form that can be used to provide better and more uniform lens shape for LEDs and other light emitting devices (see column 1, lines 62-63 of Bohn).

Re claim 22: Hawkins modified by Bohn teaches the method for manufacturing a lens-attached light- emitting element, wherein each opening of the opening array (**114** of Hawkins) consists of three micro circular openings which are located at the vertexes of a triangle (in order to make a mold for spherical lens **41** of Bohn, it would be obvious to make holes **114** of Hawkins into small holes).

Re claim 24: Hawkins modified by Bohn teaches the method for manufacturing a lens-attached light-emitting element, wherein the step (i) includes the step of making ultra violet or visible light to approximately collimated light and irradiating the collimated light approximately perpendicular to the glass substrate (as can be seen in figure 2 of Bohn, collimated light 21 is emitted).

Re claim 26: Hawkins modified by Bohn teaches the method for manufacturing a lens-attached light-emitting element, further comprising the step of cutting the light-emitting element array substrate after the step (k) (it is well-known for devices to be diced into individual devices).

Re claim 31: Hawkins modified by Bohn teaches the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element array substrate is a light-emitting diode array substrate (array of Bohn).

Re claim 35: Hawkins modified by Bohn teaches the method for manufacturing a lens-attached light-emitting element, wherein the lens is a composite lens consisting of adjacently arranged plural parts of spherical lens, each center of the spherical lenses being on the line imagined by fastening the positions where light intensity is maximum in the light-emission area, or on the positions neighbored to the line, a composite lens consisting of adjacently arranged plural parts of cylindrical lens (figure 1 of Bohn teaches adjacently arranged lens **42** abutting each other to form lens **11**), each cylindrical lens giving an axis along the line, or a composite lens consisting of adjacently arranged plural parts of spherical lens and plural parts of cylindrical lens.

16. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins modified by Bohn as applied to claim 16 above, and further in view of Mesquida.

Re claim 21: Hawkins modified by Bohn teaches substantially the entire claimed structure of claim 21, as recited in claim 16, except explicitly stating the method for

manufacturing a lens-attached light- emitting element, wherein the shape of each opening of the opening array is approximate U-shape.

Mesquida teaches the method (e.g. figure 7) for manufacturing a lens-attached light- emitting element, wherein the shape of each opening of the opening array is approximate U-shape (in order to obtain the circular U shape, it would be obvious to make the opening of the opening array a U shape).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Mesquida in the method of Hawkins modified by Bohn in order to create a device having great compactness of integration (see column 7, line 45 of Mesquida).

17. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins modified by Bohn as applied to claim 16 above, and further in view of Scifres et al. (U.S. 3,954,534; hereinafter "Scifres").

Re claim 23: Hawkins modified by Bohn teaches substantially the entire method of claim 23, as recited in claim 16, except explicitly stating the method for manufacturing a lens-attached light-emitting element, further comprising the step of coating a mold releasing agent on the surface of the recess array after the step (f).

Scifres teaches the method for manufacturing a lens-attached light-emitting element, further comprising the step of coating a mold releasing agent (5) on the surface of the recess array after the step (f).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Scifres in the method of Hawkins modified by Bohn in order to ensure a separation between mold and molded material (see column 3, line 18 of Scifres).

18. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins modified by Bohn as applied to claim 16 above, and further in view of Beauvais et al. (U.S. 6,514,877; hereinafter "Beauvais").

Re claim 25: Hawkins modified by Bohn teaches substantially the entire claimed method of claim 25, as recited in claim 16, except explicitly stating the method for manufacturing a lens-attached light-emitting element, wherein the etching stopper film is a Cr film, and the glass substrate is wet etched by a hydrofluoric acid based etchant.

Beauvais teaches the method, wherein the etching stopper film is a Cr film (chromium etch stop; e.g. column 5, line 6), and the glass substrate is wet etched by a hydrofluoric acid based etchant (HF etch; e.g. column 4, line 50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Beauvais in the method of Hawkins modified by Bohn in order to simplify manufacture by using readily available materials.

19. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins modified by Bohn as applied to claim 16 above, and further in view of Tanioka.

Re claim 32: Hawkins modified by Bohn teaches substantially the entire claimed method of claim 32, as recited in claim 16 except explicitly stating the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element array substrate is a light- emitting thyristor array substrate.

Tanioka teaches the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element array substrate (array of self-scanning LED chips; **30-1**) is a light- emitting thyristor array substrate (light emitting device is a light emitting thyristor; see claim 10 of Tanioka).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Tanioka in the method of Hawkins modified by Bohn in order to enable the manufacture of a device having an additional function of scanning and image recording.

Re claim 33: Hawkins modified by Bohn and Tanioka teaches the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element array substrate is a self- scanning light-emitting element array substrate (array of self-scanning LED chips; **30-1**).

20. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins modified by Bohn as applied to claim 16 above, and further in view of Chiu.

Re claim 34: Hawkins modified by Bohn teaches substantially the entire claimed method of claim 34, as recited in claim 16 except explicitly stating the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element

array substrate includes an antireflection film covering the light-emitting area of each light-emitting element.

Chiu teaches the method for manufacturing a lens-attached light-emitting element, wherein the light-emitting element array substrate includes an antireflection film (326) covering the light-emitting area (322) of each light-emitting element.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Chiu into the teachings of Hawkins modified by Bohn in order to increase the output efficiency (see paragraph 10 of Chiu).

Conclusion

Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE Y. MIYOSHI whose telephone number is

(571)270-1629. The examiner can normally be reached on M-F 7:30AM-5:00PM EST.
Alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art
Unit 2811

/Jesse Miyoshi/